ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Cyanobacteria in New Hampshire Waters
Potential Dangers of Blue-Green Algae Blooms

What are Cyanobacteria?

Cyanobacteria are microorganisms that are bacteria that photosynthesize. Many species of cyanobacteria may accumulate to form surface water "blooms". They are blue-green in color and may consist of thousands of individual cells.

Cyanobacteria are some of the earliest inhabitants of our waters, and they are naturally occurring in all of our lakes. However, research indicates that their abundance increases as the nutrients in a lake increase. They are part of the aquatic food web and can be eaten by various grazers in the lake ecosystem, such as zooplankton and mussels.

Although they are most often seen when floating near the surface, many cyanobacteria species spend a portion of their life cycle on the bottom of the lake during the winter months. As spring provides more light and warmer temperatures, cyanobacteria move up the water column and eventually rise toward the surface where they can form dense blooms or scums, often seen in mid to late summer and, weather permitting, sometimes well into the fall.

Why are Cyanobacteria a Concern?

Some cyanobacteria produce toxins that adversely affect livestock, domestic animals, and humans. According to the World Health Organization (WHO), toxic cyanobacteria are found worldwide in both inland and coastal waters. The first reports of toxic cyanobacteria in New Hampshire occurred in the 1960 and 1970s. During the summer of 1999, several dogs died after ingesting toxic cyanobacteria from a blue-green algae bloom in Lake Champlain. WHO has documented acute impacts to humans from cyanobacteria from the U.S. and around the world as far back as 1931. While most human health impacts have resulted from ingestion of contaminated drinking water, cases of illnesses have also been attributed to swimming in waters infested with cyanobacteria.

The possible effects of cyanobacteria on the "health" of New Hampshire lakes and their natural inhabitants, such as fish and other aquatic life, are under study at this time. The Center for Freshwater Biology (CFB) at the University of New Hampshire is currently examining the potential impacts of these toxins upon the lake food web. The potential human health hazards via exposure through drinking water and/or during recreational water activities are also a concern to the CFB and the state.

Do Cyanobacteria Exist in New Hampshire Waters?

Yes, they occur in all lakes, everywhere. In New Hampshire, four of the most common cyanobacteria include: *Anabaena, Aphanizomenon, Oscillatoria, and Microcystis*. *Anabaena* and *Aphanizomenon* produce neurotoxins (nerve toxins) that interfere with the nerve function and have almost immediate effects when ingested. *Microcystis* and *Oscillatoria* are best known for producing hepatotoxins (liver toxins) known as microcystins. *Oscillatoria* and *Lyngbya* (another blue-green algae) also produce dermatotoxins, which cause skin rashes.

Should You be Concerned about Swimming in or Drinking from a New Hampshire Lake?

Both DES and UNH have extensive lake monitoring programs. Generally, the water quality of New Hampshire's lakes is very good. However, the state strongly advises against using lake water for consumption, since neither in-home water treatment systems nor boiling the water will eliminate cyanobacteria toxins if they are present.

If you observe a well-established blue-green algae bloom or scum in the water, please comply with the following:

- Do not wade or swim in the water!
- Do not drink the water or let children drink the water!
- Do not let pets or livestock into the water!

Exposure to toxic cyanobacteria scums may cause various symptoms, including nausea, vomiting, diarrhea, mild fever, skin rashes, eye and nose irritations, and general malaise. If anyone comes in contact with a blue-green algae bloom or scum, they should rinse off with fresh water as soon as possible.

If you observe a blue-green algae bloom or scum, please call DES at 271-2304. DES will sample the scum and determine if it contains cyanobacteria that are associated with toxic production. An advisory will be posted on the immediate shoreline indicating that the area may not be suitable for swimming. DES will notify the town health officer, beach manager, and/or property owner, and the N.H. Department of Health and Human Services. DES will continue to monitor the water and will notify the appropriate parties regarding the results of the testing. When monitoring indicates that cyanobacteria are no longer present at levels that could harm humans or animals, the advisory will be removed.